

Allotype.—Female, Malekula, New Hebrides, January 1930 (L. E. Cheesman), B. M. 1930-178.

Paratypes.—2 males, same data as holotype; female, same data as allotype; female, Malekula, Ounua, March and April 1929 (L. E. Cheesman), B. M. 1929-343.

Variation.—The female paratype, B. M. 1930-178, has a blackish spot ventrally near the apex of each femur.

Lophoteles plumula Loew

Lophoteles plumula Loew, Berlin. Ent. Zeitschr. **2**: 111. 1858.

Lophoteles plumula Loew, Kertész, Ann. Mus. Nat. Hungarici **12**: 513. 1914.

Two males, Segond Channel, Espiritu Santo, New Hebrides, July 19 and August 10, 1944 (J. Laffoon), are tentatively referred to this species. They agree with Kertész's description except that the appressed hairs of the abdominal terga are black; the lateral erect hairs, as well as those of the venter, are, however, pale. These specimens are more slender than the males of the preceding species; the antenna except the style is wholly yellow, with yellow hairs on the first two segments; the pale tomentum of the mesonotum extends onto the scutellum; and the halteres are but slightly infuscated.

Genus *Evaza* Walker

Evaza Walker, Proc. Linn. Soc. London **1**: 109. 1857.

Evaza fulviventris Bigot

Evaza fulviventris Bigot, Ann. Soc. Ent. France (5) **9**: 220. 1879.

This species may be added to the Solomon Islands list on the basis of a male, Bougainville Island, 1944 (A. B. Gurney), which apparently belongs here. The scutellum has only one pair of spines, the middle pair being missing and without trace of scars, but this seems to be an abnormality. The side spines are in the normal position. Otherwise, the specimen checks with specimens from New Guinea and with Bigot's description. In my key to the Solomon Islands Stratiomyidae (James, 1948, pp. 187-191) this species runs to couplet 29, but may be distinguished from other Solomon Islands *Evaza* by the wholly black thoracic tomentum, the reddish-yellow legs (except the hind tibiae largely blackish), and the partially (female) to almost wholly (male) reddish-yellow abdomen.

LITERATURE CITED

- BEZZI, MARIO. *Diptera Brachycera and Athericera of the Fiji Islands*. 1928.
- HARDY, G. H. *Notes on Australian Stratiomyiidae*. Proc. Roy. Soc. Queensland **44**: 41-49. 1932.
- . *Australian Stratiomyiidae II. Tribe Myxosargini*. Proc. Roy. Soc. Queensland **55**: 11. 1943.
- JAMES, MAURICE T. *A review of the Myxosargini*. Pan-Pacific Ent. **18**: 49-60. 1942.
- . *Flies of the family Stratiomyidae of the Solomon Islands*. Proc. U. S. Nat. Mus. **98**: 187-213. 1948.

ENTOMOLOGY.—*New species of Nearctic Rhyacophila (Trichoptera, Rhyacophiliidae)*.¹ HERBERT H. ROSS, Illinois State Natural History Survey. (Communicated by C. W. Sabrosky.)

The four new species of Trichoptera described in this paper are from the western montane region. One of them, *Rhyacophila willametta*, is an addition to the remarkably large list of species in the genus that seem to be isolated survivors of divergent and distinctive phyletic lines.

The close structural similarity and the known distribution of *R. tucula* and *R. alberta* suggest very strongly that they were formed from isolated populations during the last glacial advance. *R. alberta* is known only from the Uintah and Rocky Mountain

ranges, distributed from Utah and central Colorado to middle Alberta. *R. tucula* occurs in the Cascade Range from Oregon to southern British Columbia, with a single known collection from the eastern ranges, in Yellowstone National Park. It is interesting to speculate that the two species arose during early Eldoran time through isolation of similar populations at points far south of their present habitats. If this is true, the slight overlap of present distribution would indicate a northward movement to areas where the various mountain ranges are close together and intermingling occurs.

¹ Received April 25, 1950.

Genus *Rhyacophila* Pictet*Rhyacophila tucula*, n. sp.

This species is a close relative of *alberta* Banks, differing most obviously in the proportions of the apical segments of the claspers; in *tucula* most of the brushlike dorsal portion of the apical segment extends beyond the end of the basal segment (Fig. 7), whereas in *alberta* (Fig. 6) this portion extends only a short distance beyond the end of the basal segment. In addition, the lateral arm of the aedeagus in *tucula* ends in a brush of dense setae (Fig. 2), and in *alberta* this region is expanded into a broad lobe bearing a fairly even pecten of stouter curved spines, beyond which the arm narrows again and bears a single long spine (Fig. 1).

Male.—Length from front of head to end of the folded wings, 12 mm. Color various shades of brown, darkest on the dorsum, the antennae, palps, and legs yellowish brown, the wings light brown and completely irrorate with a spotlike and barlike medium brown pattern. General structure typical for genus. Genitalia as in Fig. 7. Ninth segment short and annular except for the excavations to receive the bases of the claspers. Tenth tergite with dorsal sclerite narrow and humped, ending in a short, sharp projection; lateral sclerites only lightly sclerotized and ovate at apex; mesal sclerites ovate and projecting a short distance beyond lateral sclerites. Clasper with very long basal segment, which is nearly parallel-sided; apical segment much shorter, boot-shaped, with an angular heel and a moderately produced toe; mesal side of clasper bearing (1) a large sclerotized tendon which arises from the basal segment and joins the dorsal connective of the aedeagus, and (2) a pair of cushionlike areas of black spicules on the apical segment, as shown in Fig. 7A. Aedeagus consisting of a horseshoe-shaped dorsal connective, a short tubular base ending in a crenulate extensile apex, and arising from this is a pair of long, slender lateral arms and a mesal style containing the penis; the lateral arms bear a long comb of short spines which extend along the apical third of each arm (Fig. 2).

Female.—Size, color, and general structure as for male. Eighth segment (Fig. 3) with apex of venter produced and arcuate, apex of dorsum also produced, but more narrowly so, the segment considerably narrowed dorsoventrally toward apex. Spermatheca (Fig. 5) consisting of a somewhat bulbous, vasiform base and a long, slender,

flattened apex, which is membranous ventrally and dorsally has a pair of lateral sclerotized bands extending from the middle of the process to and around the apex.

Holotype.—Male, Gardner River, Yellowstone National Park, Wyo., August 22, 1946, W. E. Ricker.

Allotype.—Female, same data.

Paratypes.—BRITISH COLUMBIA: Chilliwack Lake, Silver Creek, September 14, 1936, W. E. Ricker, 1 ♂. Cultus Lake, along Chilliwack River, August 25, 1934, W. E. Ricker, 1 ♂; same but September 9, 1937, 2 ♂. OREGON: McKenzie Bridge, September 21, 1934, R. E. Dimmick, 2 ♂, 2 ♀. WASHINGTON: Spirit Lake, July 20, 1947, C. P. Alexander, 1 ♂, 1 ♀. WYOMING: Same data as for holotype, 4 ♂.

Types in the collection of the Illinois Natural History Survey except the specimens from Spirit Lake, which are in the collection of D. G. Denning.

Rhyacophila alberta Banks

Rhyacophila alberta Banks, Bull. Mus. Comp. Zool. **62**: 21. 1918. ♂.

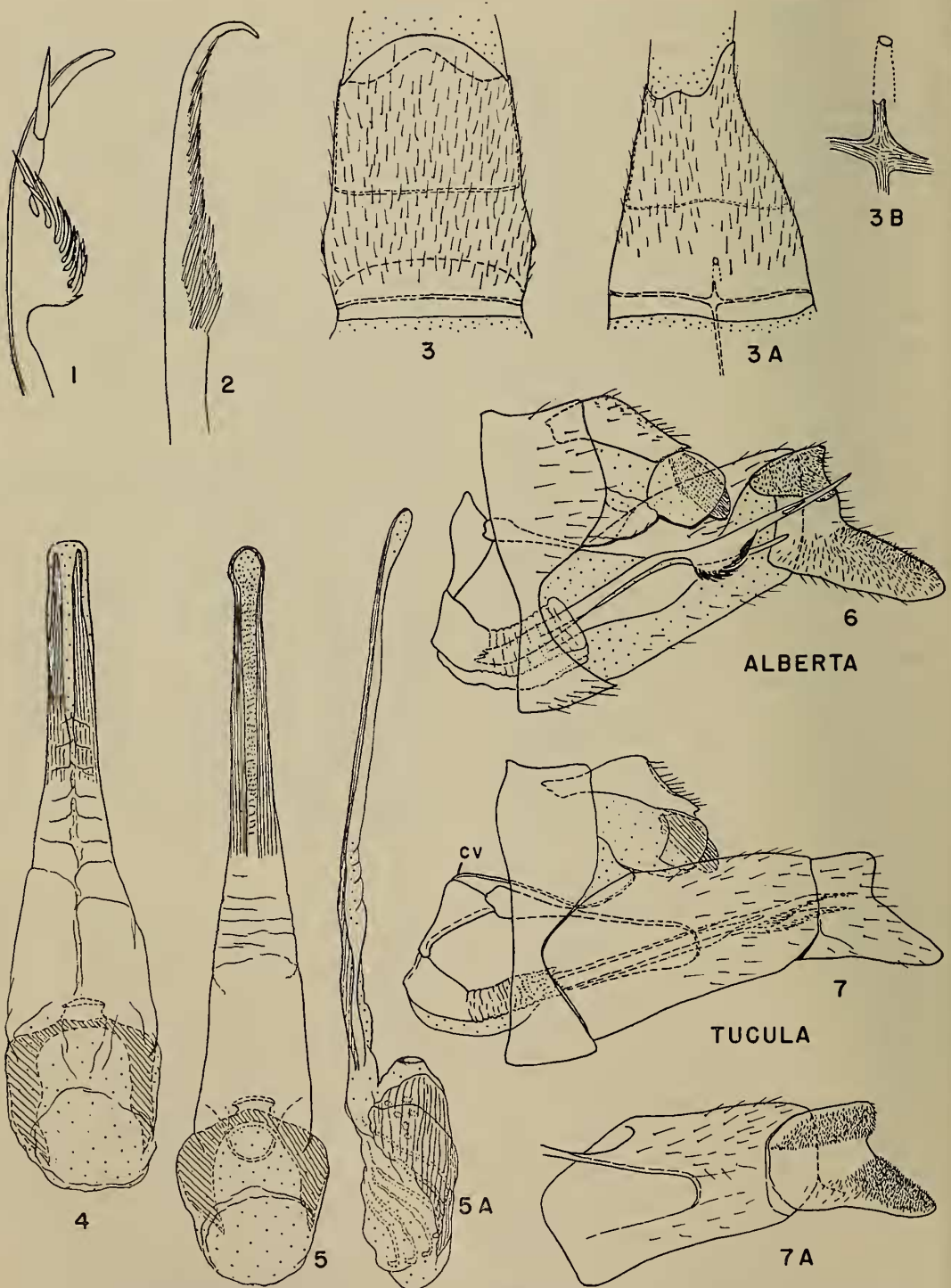
Rhyacophila mirus Denning, Psyche **55**: 21. 1948. ♂, ♀. New synonymy.

This species and *tucula* are very closely related. Figs. 1, 4, and 6 illustrate the diagnostic characters of the male genitalia and the female spermatheca. This latter structure differs from that of *tucula* chiefly in that the dorsal sclerotized bands do not reach the tip of the elongate apical portion.

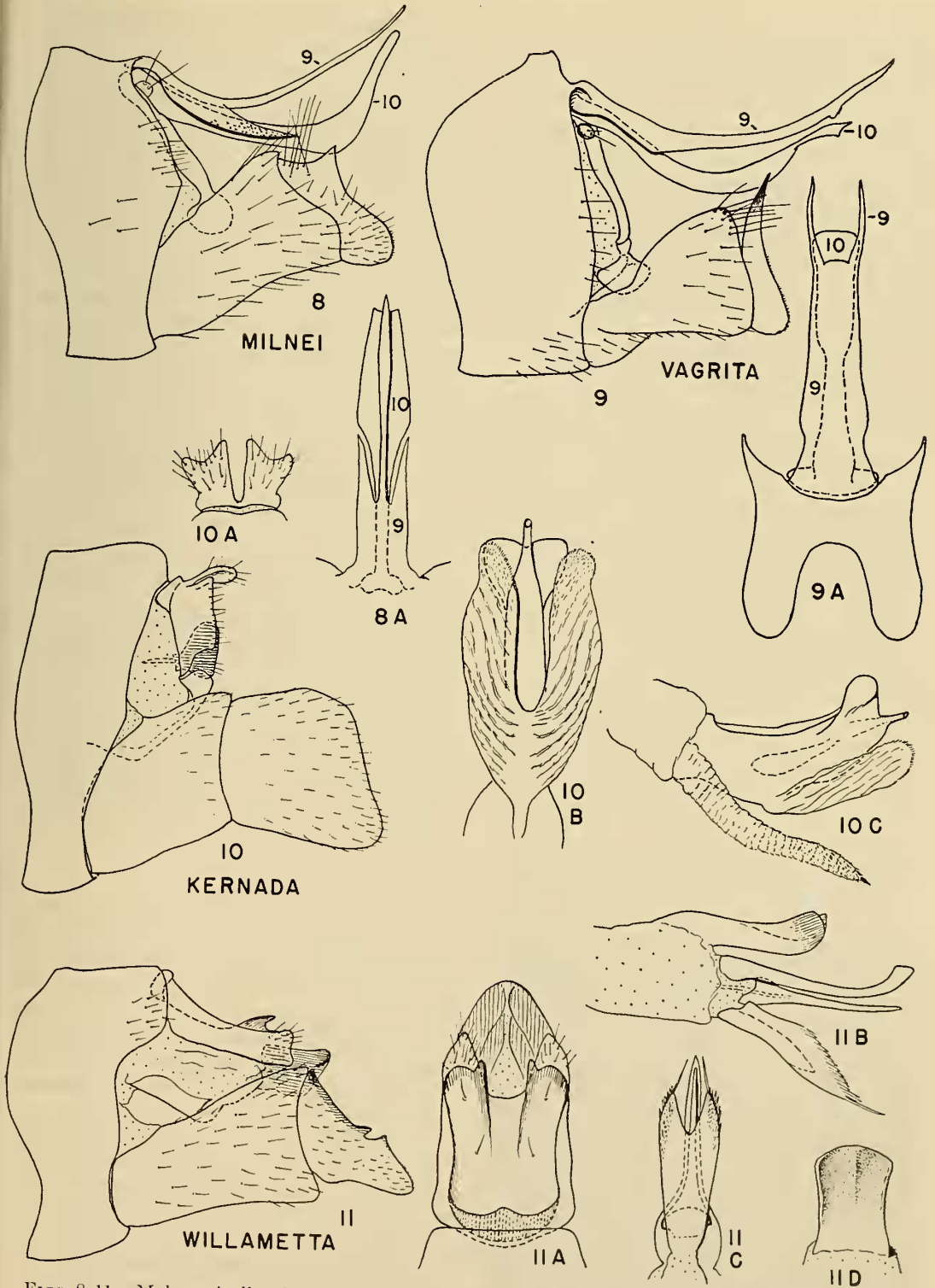
The ranges of *alberta* and *tucula* are very interesting. Records for *alberta* are available from Banff, Alberta (type of *alberta*); Tolland and Silverton, Colo.; Uintah Mountains, Utah; and Snowy Range Mountains, Albany County, Wyo. (type of *mirus*). Comparison of these localities with those for *tucula* indicates that *alberta* is apparently restricted to the eastern montane region of the West, whereas *tucula* appears to be the dominant species of the group in the western ranges. The ranges of the two species overlap, at least in Wyoming, and subsequent collecting may demonstrate that this occurs over a fairly wide area.

Rhyacophila willametta, n. sp.

This species is probably most closely related to *perda* Ross but differs markedly from it in the shape of every structure, especially the short,



FIGS. 1-7.—Parts of *Rhyacophila*: 1, *R. alberta* Banks, apex of lateral arm of aedeagus; 2, *R. tucula*, n. sp., apex of lateral arm of aedeagus; 3, *R. tucula*, ventral aspect of eighth segment of female; 3A, same lateral aspect; 3B, detail of apodeme; 4, *R. alberta*, spermatheca, dorsal aspect; 5, *R. tucula*, spermatheca, dorsal aspect; 5A, lateral aspect; 6, *R. alberta*, male genitalia, lateral aspect; 7, *R. tucula*, male genitalia, lateral aspect; 7A, inner face of clasper.



FIGS. 8-11.—Male genitalia of *Rhyacophila*: 8, *R. milnei*, n. sp., lateral aspect; 9, *R. vagrita* Milne, lateral aspect; 8A, eighth and ninth tergites, dorsal aspect; 9, *R. vagrita* Milne, lateral aspect; 9A, ninth and tenth tergites, dorsal aspect; 10, *R. kernada*, n. sp., lateral aspect; 10A, tenth tergite, dorsal aspect; 10B, same, main portion of aedeagus, ventral aspect; 10C, aedeagus, lateral aspect; 11, *R. willametta*, n. sp., lateral aspect; 11A, tenth tergite, dorsal aspect; 11B, aedeagus, lateral aspect; 11C, same, ventral aspect; 11D, same, dorsal aspect.

wide, dorsal process of the aedeagus and the declivous posterior margin of the apical segment of the clasper.

Male.—Length from front of head to tip of folded wings, 13 mm. Color of dorsum dark brown; appendages and venter yellowish brown; wings smoky brown with a few small lighter areas near the apex of the distal cells. General structure typical for genus. Genitalia as in Fig. 11. Ninth segment annular, the dorsal part longest, projecting beyond the remainder. Tenth tergite with dorsal and lateral lobes fused into a somewhat rectangular shelf, the dorsal lobe subdivided into a pair of lateral processes which project upward and posteriad; the lateral lobes are apparently fused with the dorsal lobe, each line of fusion appearing as a dorsal ridge; mesal lobes fused dorsad, the two halves separated ventrally by an elliptic opening. Clasper with basal segment elongate and becoming wider toward apex; apical segment fairly short, the dorsal margin declivous, this declivity ending in a short, sharp process which appears to represent the heel, beyond which is a moderate-sized, somewhat rounded toe.

Aedeagus (Fig. 11B, C, D) with four sets of processes: (1) A stout, heavily sclerotized, wide dorsal process excavated and carinate dorsad; (2) a single, broad, pointed, and upturned process below this; (3) below this a narrower, pointed process bearing the penis (these last two each with a bulbous base); and (4) a scooplike ventral process which bears a tight comb of thin spines along its lateral margin.

Holotype.—Male, Salt Creek Falls, Willamette Pass, Oreg., August 7, 1948, Kenneth M. Fender.

Paratype.—Male, Store Gulch Guard Station, Siskiyou Mountains, Oreg., August 9, 1948, Kenneth M. Fender. (Types in the collection of the Illinois Natural History Survey.)

Rhyacophila milnei, n. sp.

This species is a close relative of *vagrita* Milne, differing in having the apical segment of the clasper slightly longer and produced into only a short, broad point on the posterodorsal corner and in having the elongate projection of the ninth tergite trifid rather than bifid.

Male.—Length from front of head to tip of folded wings, 9 mm. Color light brown, the venter and appendages lighter, the wings very light brown and with only a faint indication of a pattern. General structure typical for genus. Male genitalia as in Fig. 8. Ninth segment annular,

with a long mesal process arising from the posterior margin of the dorsum, this process trifid, consisting of a pair of lateral spiculate processes and a much longer, slender, fusiform mesal process. Tenth tergite with dorsal process very long and upturned, narrow at base and widened just beyond the middle to form a large spadelike apex from dorsal view; at the base of this process is the minute, knoblike cercus; from the dorsal lobe extends a straplike mesal arm ending in a bulbous apex flanked by a pair of small lateral flaps. Clasper with basal segment moderately long and deep, largest at apex; apical segment short and irregular, the heel forming a sharp, triangular point, the toe short, rounded, and bearing a moderately dense cushion of mesal spicules. Aedeagus simple, broad and flat, the extreme apex with a narrow, dorsal, beaklike process which curves ventrad; from the ventral margin there extends an ovate, membranous, tongue-like flap which extends slightly beyond the remainder of the aedeagus.

Holotype.—Male, Banff, Alberta, September 5, 1922, C. B. D. Garrett.

Paratypes.—Three males, same data as for holotype. (Types in the collection of the Illinois Natural History Survey.)

The four specimens listed above were originally designated as paratypes of *vagrita*. So great is the similarity of the two species, both in general appearance and structure of genitalia, that the existence of a second species in the series was not suspected until I cleared the genitalia of several specimens.

Rhyacophila kernada, n. sp.

This species is a very close relative of *coloradensis* Banks, differing from it in the extremely small incision, seen from lateral view, between the dorsal and lateral flaps of the lobes of the tenth tergite, and the completely membranous, spiculate, lateral arms of the aedeagus. In *coloradensis* a long portion of the apex of these lateral arms is sclerotized.

Male.—Length from front of head to tip of folded wings, 10 mm. Color dark brown above, lighter brown on the venter, the apices of the leg segments darker brown, the front tibia with a light band just beyond middle, the hind legs in general almost straw-color and contrasting with the light brown of the front and middle legs. Wings with irregular irrorate pattern, with a lighter and somewhat bandlike area on the ante-

rior portion basad of the stigma. General structure typical for genus. Genitalia as in Fig. 10. Ninth segment annular, the dorsum higher than the tenth tergite, and with a steep apical declivity. Tenth tergite composed of (1) a dorsal pair of earlike lobes, each with a small dorsal and deep lateral flap, (2) a mesal pair of heavily sclerotized, closely appressed sclerites appearing bulbous from lateral view and together circular from posterior view, (3) a very small, ovate sclerite with a short, sclerotized, mesal apodeme, this sclerite situated between the preceding two, and (4) a pair of small ventral lobes which unite below this entire structure and articulate with the dorsum of the aedeagus. Clasper with both segments about

equal in length, depth, and area, both rhomboidal, the apical segment slightly incised at apex with the apical third of the mesal aspect covered with small black spicules. Aedeagus beyond basal tube consisting of a central sclerotized portion which at the apex has a pair of lateral knobs and a single slender, mesal, beaklike projection; arising from the base of this structure a large U-shaped semi-membranous flap; and, arising at the base, a pair of membranous extensile arms, the apical third clothed with dense, pale spicules, the extreme tip with a single sharp spine.

Holotype.—Male, Kern River, Road's End, Calif., September 25, 1940, at light. Deposited in the United States National Museum.

MALACOLOGY.—*A new terrestrial mollusk from Mexico.*¹ PAUL BARTSCH, U. S. National Museum.

The new species of gastropod described below, belonging to the genus *Coelostemma* Dall, is based on specimens collected about 29 miles west of Jiménez, Chihuahua, Mexico, and presented to the U. S. National Museum by George F. Freytag, of the Missouri Botanical Garden. Mr. Freytag states that while collecting in the Chihuahuan desert he came upon this snail and brought back about a dozen examples. He says: "They seem to be night travelers and attach themselves during the day by sealing their shell openings to the cliff."

Coelostemma freytagi, n. sp.

Shell elongate-conic, pale horn-colored, with the peristome almost white. The nucleus consists of about $2\frac{1}{4}$ turns, which are inflated and strongly rounded and form a bulbous apex. The nuclear whorls are finely granulose. The first eight postnuclear whorls increase gradually in size; the rest form a cylindrical spire, which becomes very slightly contracted toward the base. All the postnuclear turns are crossed by strong, sublamellar, hollow, retractively curved axial ribs, which extend equally strong from the summit of the periphery. The ribs are separated by spaces that are not quite constant in width but average about $1\frac{1}{2}$ times as wide as the ribs. On the first postnuclear whorls the ribs are feeble, but on the second turn 20 strong ribs are present. On the

tenth turn there are 26, while the last whorl bears 16 plus a few wrinkles immediately adjoining the peristome. Suture moderately impressed, rendered slightly sinuous by the axial ribs. Last whorl solute for about one-tenth of a turn. Periphery slightly angulated. Base short, well rounded, and crossed by the axial ribs, which extend slightly diminished to the umbilical chink. Aperture subcircular. Peristome broadly flatly expanded. The columella is very broad, about one-third the width of the inside of the whorls; it is smooth and glistening and shows faint axial markings.

The holotype, U.S.N.M. no. 601851, has 18 whorls, and measures: Length, 18 mm; diameter of middle turns, 4 mm. Five paratypes are listed as U.S.N.M. no. 601852.

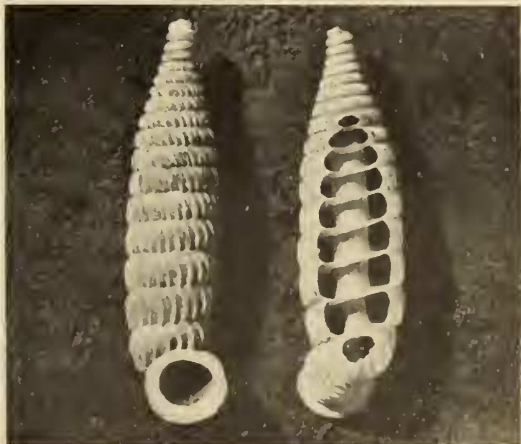


FIG. 1.—*Coelostemma freytagi*, n. sp.

¹ Received May 8, 1950.